behaviour of water is exceptional, and hence it is particularly ill suited for the use to which it has been put. Again, on account of the smallness of the rotation in water, the unavoidable inaccuracies in determining its rotation, and thus estimating the strength of the magnetic field, produce a larger percentage error in the results than if a liquid, such as benzene, having a considerably higher rotation than water, were used for this purpose.

V. "The Influence of the Cerebral Cortex on the Larynx." By J. S. Risien Russell, M.D., M.R.C.P., Assistant Physician to the Metropolitan Hospital. Communicated by Professor Victor Horsley, F.R.S. Received June 5, 1895.

(From the Pathological Laboratory of University College, London.)

(Abstract.)

This research was undertaken in order to attempt to differentiate an abductor centre in the cerebral cortex of the dog, but, as several new observations were made during the course of the investigation, similar experiments were performed in the cat in order to compare the results obtained in this animal with those obtained in the dog.

Among the preliminary considerations was the question as to what influence the condition of the peripheral laryngeal apparatus in an animal has on the effects obtained from its central nervous mechanism, and the conclusion arrived at was that the influence must be comparatively insignificant, as abduction or adduction of the vocal cords could be obtained on excitation of the appropriate area of the cerebral cortex, irrespective of whether abduction or adduction was obtained on excitation of the recurrent laryngeal nerves in the same animal.

No evidence of unilateral representation of the movements of the vocal cords in the cerebral cortex was obtained; and in testing this point one recurrent laryngeal nerve was divided transversely, when it was found possible to influence the vocal cord whose nerve was intact, with equal ease on stimulation of either cerebral hemisphere.

The question of inhibition of antagonistic muscles by electrical excitation of the cerebral cortex, on the lines adopted by Sherrington with regard to antagonistic muscles in other parts of the body, was tested by first dividing the adductor fibres in both recurrent laryngeal nerves, leaving the abductor fibres intact, and then exciting the adductor centre with strong induced currents; but no evidence of inhibition of the abductor muscles was obtained.

The major part of the paper deals with the movements of the vocal cords which could be evoked on excitation of different foci in the cerebral cortex. It was found that both in the dog and cat there

The Royal Society is collaborating with JSTOR to digitize, preserve, and extend access to *Proceedings of the Royal Society of London.* www.jstor.org

existed a focus, excitation of which resulted in adduction of the vocal cords, and another near to this, stimulation of which resulted in abduction of the cords. While in the cat it was possible to differentiate these movements without any preliminary measures being adopted, it was otherwise in the dog, for it was only after the adductor fibres of one recurrent laryngeal nerve had been divided transversely that it first became possible to evoke abduction of the vocal cords on excitation of the cortex, though in subsequent experiments it was sometimes possible to evoke this movement on excitation of the cortex of the dog without adopting this preliminary measure. The other effect on the cords, which it was as a rule found most difficult to differentiate from that of abduction, was acceleration of their movements.

In further exploring the cortex it was found that on the anterior composite gyrus, below the abductor centre, there existed a focus, excitation of which resulted in what is described as a clonic adductor effect on the cords, in which the cords were first brought into a position of moderate adduction, and then there was added rapid short to-and-fro excursions.

On passing within the confines of Spencer's area for arrest of respiration, it was found that in the peripheral parts of this area there existed three foci, excitation of which affected the cords in different ways. The most anterior of these foci was responsible for arrest of the cords in adduction, *i.e.*, in the expiratory stage of their excursions; excitation of the focus behind this, and corresponding, probably, to Horsley and Semon's abductor centre in the cat, was followed by arrest of the cords in abduction, *i.e.*, their inspiratory position; while the most posterior focus, which is situated at about the junction of the anterior composite and anterior sylvian convolutions, resulted in intensification combined with acceleration of the movements of the cords when stimulated. Excitation of Spencer's chief focus for arrest of respiration on the olfactory lobe, resulted in arrest of the cords in the position they occupy during expiration in dogs, and in the position they occupy during inspiration in cats.

VI. "An Enquiry into the Nature of the Vesicating Constituent of Croton Oil." By WYNDHAM R. DUNSTAN, M.A., F.R.S., and Miss L. E. BOOLE, F.I.C., Lecturer on Chemistry in the London School of Medicine for Women. Received June 5, 1895.

(Abstract.)

The vesicating constituent, or more strictly, the pustule-producing constituent of croton oil, has been the subject of investigation by